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Transfer of environmentally sound technologies, cooperation and capacity-building

Report of the Secretary-General

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INTRODUCTION

1. The present report is intended to provide a brief update on the steps taken and results achieved to implement the work programme on the transfer of environmentally sound technology approved by the Commission on Sustainable Development at its third session. 1/ The work programme focused on three related areas: (a) improving access to and dissemination of information on environmentally sound technology, (b) capacity-building and institutional development, and (c) financial and partnership arrangements.

2. The present report is based on national information, as available at the time of its preparation, as well as on information supplied by regional and international organizations. Inter-sessional meetings organized by Governments, regional organizations and the United Nations system have been an important source of information, and have provided important support in advancing the work and recommendations of the Commission. The meetings have been a means of spreading information about the work programme and gathering information about problems being encountered at the national and regional level, and have helped to identify the key issues that may need to be brought to the attention of the Commission for further consideration. In following the development of the work programme, special attention has been given to initiatives and activities at the regional level, as well as to the special needs and problems of small and medium-sized industries. The present report should be read in relation to its addendum, which provides greater detail on some of the points it raises.

I. STATE OF IMPLEMENTATION OF THE WORK PROGRAMME ON THE TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGIES, COOPERATION AND CAPACITY-BUILDING

A. General trends

3. While there is a trend within industry towards increased resources and productive efficiency, there is also a realization that at the current rate, improvements in efficiency are not likely to keep pace with gross world production and a rapidly increasing world population. Hence, significant and increasingly rapid gains in resource efficiency are required to support sustainable industrial development. The Wuppertal Institute has calculated that a four to tenfold decrease in material intensity per unit of service (MIPS) would be required for a successful transition to sustainable development by 2010. Two notable high-level conferences that dealt with sustainable industrial development were a ministerial conference on the theme "Environment for Europe: business and environment" (Sofia, Bulgaria, 23-25 October 1995) and an international conference on the theme "Sustainable industrial development: sharing responsibilities in a competitive world" (Amsterdam, 22 and 23 February 1996).

4. A recent study, however, noted that less than 20 per cent of North American and European companies are at the forefront of the latest advances in eco-efficiency and cleaner production. A major difficulty in integrating environmental management into the business fabric is being called the green

wall. A recent survey of 185 United States and Canadian companies showed that the green wall is primarily caused by a lack of acceptance of environmental management by business functions and a different perception of priorities among environmental managers, with the result that environmental initiatives do not capture their fair share of resources and management commitment. In addition, front-runner companies face particular competitive disadvantages if the efforts that are associated with superior environmental performance are not rewarded in the marketplace, which occurs when there is limited or very uneven demand for innovative and environmentally preferred technologies in world markets. 2/

5. In order to achieve the efficiency gains that are needed to support sustainable industrial development, Governments and industries need to forge a new relationship (which is already emerging in some cases) that recognizes the need to remain competitive while at the same time reducing environmental stress. A well-known programme is the 33/50 programme, initiated by the Environmental Protection Agency of the United States Government in 1991, under which companies voluntarily committed to a 33 per cent reduction in environmental releases and off-site disposal of 17 toxic chemicals by 1992, and a 50 per cent reduction by 1995. The Yorktown project, carried out jointly by the Environmental Protection Agency and Amoco Oil Company, demonstrated that it was possible to obtain equivalent environmental protection in a more cost-effective way than current laws and regulations allow. It was found that thoughtful innovations could achieve at least 95 per cent of the release reductions required by current regulations for 20 per cent of the cost of the mandated programmes. 3/

6. Another important trend is the development of environmental management standards and reporting requirements at the national and international levels, notably the BS 7750 standard developed by the British Standards Institute, the Regulation on Eco-Management and Audit (EMAS) of the European Union (EU), and the international environmental management standards established by the International Organization for Standardization (ISO). While ISO 14000 does not set uniform specific performance criteria or goals, it does require signatory companies to establish systems for environmental management. BS 7750 and EMAS are both voluntary schemes that have proven to be popular. It is too soon to predict how the adoption of the ISO 14000 series of standards will affect the way firms meet environmental goals, but it will make their production processes more transparent and may have a significant impact in encouraging companies to adopt cleaner, more efficient systems of production.

7. A number of Governments are testing economic instruments as a means to encourage greater energy and materials efficiency or to influence consumer demand (deposit refund schemes have achieved high recycling rates for beverage containers in many that are members of the Organisation for Economic Cooperation and Development (OECD)). Among developing countries, Malaysia has also been successful in phasing in pollution charges for palm oil and rubber factories, which resulted over time in the implementation of more efficient methods of effluent treatment. 4/ Some Governments are also trying to make their regulatory framework more conducive to private-sector innovations, by providing the private sector with greater flexibility in determining how to meet environmental standards. One way of doing this is to use regulations that specify the upper limits of waste production but leave it to the discretion of firms how they actually meet such limits. 5/ The early involvement of the

private sector in designing environmental regulations and compliance procedures is being encouraged. For example, Zimbabwe opens new draft regulations to comments by all interested parties, and also suggests their voluntary compliance for a specific period before they become mandatory. 5/ But the use of economic instruments is still limited, and is subject to financial and political problems.

8. Some countries have adopted programmes to stimulate investments in environmentally sound and economically compatible productive systems. 6/ Such programmes have been implemented, in some cases, with the assistance of external donors. The EU, for example, assisted in the implementation of a number of structural reform projects in Eastern European countries with the objective of helping private-sector companies in the region to invest in cleaner production and environmentally sound technologies. 7/ The Dutch Programme for Cooperation with Central and Eastern Europe has assisted in privatization and entrepreneurship, and in the restructuring, rationalization and upgrading of the private sector in several Eastern and Central European countries, with a special emphasis on sustainable production processes and energy-saving techniques in the private sector of Eastern and Central European countries. Part of the budget of the cooperation programme has been allocated to environmental technology cooperation. 8/

9. Over the last year, considerable attention has been given to small and medium-sized enterprises (SMEs), because the biggest challenge for increased efficiency will be in this sector of industry. SMEs make up the bulk of business ventures around the world and their environmental implications and resource demands are equally large. In many countries, the bulk of the untreated industrial pollution originates with the small and medium-sized industrial sectors, which frequently lack the resources and access to finance needed to improve the efficiency of resource use and to implement cleaner production methods. The Asian and Pacific Centre for Technology Transfer acts as a brokering agent in the transfer of environmentally sustainable technologies (ESTs) to SMEs in the Asia and the Pacific region. The Government of India has launched a campaign to encourage the formation of waste minimization circles in the industrial sector, especially among small-scale firms. The National Productivity Council of India has carried out a number of activities in support of pollution reduction in SMEs. Nevertheless, more concentrated international and national attention needs to be given to the problems of this sector.

B. Improving access to and dissemination of information on environmentally sound technologies

10. In response to the request of the Commission at its third session, the United Nations Environment Programme (UNEP) prepared an updated survey that contains an in-depth analysis of existing information systems and sources related to ESTs. The objective of the survey was to identify concrete measures for increasing compatibility and cooperation among these systems and sources, including the need for a consultative mechanism to improve communication between information providers and users. 9/ An expert meeting on information systems on ESTs, hosted by UNEP in Paris on 9-11 October 1995, discussed the proposed measures.

11. It is clear, from the discussion of the expert meeting on the information requirements of end-users and the role of intermediaries in the field as well as from the presentations about some of the operational databases, that there is a gap in information dissemination. The gap exists not in the availability of information on ESTs but in the ability of technology suppliers, users and intermediaries to know about them and access all the available databases. A consultative mechanism in the form of an EST information system network could well help bridge this gap, by enabling intermediaries to interact with other, less familiar databases, as well as to consult other intermediaries in order to share experience and knowledge that would be useful to their clients. In the result of the discussions and presentations, the meeting proposed possible activities of a consultative mechanism (see addendum to the present report). A summary of the report of the meeting will be before the Commission as a background document provided by UNEP.

12. As an outcome of the expert meeting, UNEP will establish a consultative mechanism in the form of an EST information system network that is consistent with the conclusions of the expert meeting, as part of the UNEP 1996-1997 work programme. The basic framework for a consultative mechanism will initially be built around three UNEP offices, Industry and Environment (Paris), the International Environment Technology Centre (Japan), and the International Environmental Information System (INFOTERRA), as well as their collaborative regional and sectoral partners. The general mission of the consultative mechanism would be to work towards enhancing a collaborative network of centres that would have access to EST information databases. 9/

13. In order to enhance the effectiveness of the International Cleaner Production Information Clearing-house (ICPIC) established by UNEP, databases of technical and policy case-studies, publication abstracts, expert institutions and bulletins of cleaner production information have recently been included. A diskette version of ICPIC became available in December 1995. An electronic mail (E-mail) connection for ICPIC has been established 10/ that provides immediate access to the UNEP cleaner production programme. UNEP also intends to make the database available through the Internet. 11/

C. Capacity-building for managing technological change

1. Technology needs assessment as a tool for promoting technology transfer and capacity-building

14. There is an emerging interest in the use of national technology needs assessment (NTNA) as a tool for facilitating and possibly accelerating the development, adoption and diffusion of ESTs. NTNAs were seen to provide added value to a number of different actors in the technology transfer process. For national Governments of the countries that carry out and implement them, NTNA offers a portfolio of priority actions in technology transfer and capacity-building, based on the assessment of actual technology demand. For the different stakeholders in the target country, the NTNA process is an opportunity to enter into a national dialogue on socio-economic and environmental strategies and participate in the planning and execution of capacity-building actions regarding the uptake of ESTs. For the international community and donors, it

presents an opportunity to emphasize the demand-driven approach, and to tailor international cooperation and technology transfer to the actual needs of the beneficiaries in the countries concerned, and to prepare technology transfer projects that can be undertaken by the private sector and can thus harness the potential technology and financing capacities of the private sector.

15. An NTNA pilot study carried out jointly by the Netherlands and Costa Rica was recently completed. Pakistan and Switzerland carried out an NTNA for Pakistan, and the European Commission is planning a similar initiative for Tunisia. Furthermore, a number of multilateral donor organizations, such as the World Bank, UNEP and the European Union, have conducted NTNAs on a regular basis in connection with their development and/or technical assistance cooperation activities. 12/

16. The Governments of the Netherlands and Switzerland co-organized an international expert meeting on the assessment of technological needs for sustainability (Scheveningen, the Netherlands, 5-7 February 1996). The objective of the meeting was to determine the most favourable conditions and approaches for the planning, execution and implementation of NTNAs.

17. As an outcome of the discussions and presentations, the meeting suggested that an appropriate mechanism, in the form of an expertise network for national technology needs assessment among experienced and interested national, regional and international institutions, could be established and maintained. The network could accomplish, inter alia, functions related to monitoring and assessing the efficiency and effectiveness of NTNAs as a tool for improving the utilization of ESTs, as well as functions related to the further development and the dissemination of guidelines for NTNAs.

18. A number of NTNAs were carried out in African countries, particularly at the household, community or institutional levels. They were conducted by national or regional research institutions that have developed the capacity to undertake sector-specific TNAs, such as the Ghana Food Research Institute, the Nigerian Institute for Oceanography and Marine Research, the South African Foundation for Research and Development, and the African Regional Centre for Technology. 13/

19. The African Regional Centre for Technology (ARCT), the Department for Policy Coordination and Sustainable Development of the United Nations Secretariat and the Economic Commission for Africa (ECA) jointly organized an African regional workshop on technology needs assessment in support of the transfer of ESTs and technology cooperation (Dakar, 17-19 January 1996). The meeting demonstrated the critical role that NTNAs can play in promoting the transfer of environmentally sound technology, particularly how such technology can be applied to solve local and community-level problems.

20. Conclusions and recommendations emphasized, among other things, the important role that African technology centres or equivalent networks can play in monitoring and disseminating guidelines for NTNAs that have been proven useful. Such institutions could also give support in adapting guidelines for NTNAs to specific user needs and conditions. The conclusions and recommendations endorsed by the meeting are available to the Commission as part

of the report of the workshop, and also summarized in the addendum to this report.

2. Technology centres and facilitators of technology transfer

21. National and local cleaner production centres are beginning to play a major role in establishing nationwide cleaner production networks, coordinating cleaner production programmes, acting as an interface among industry, Governments, universities and non-governmental organizations, and disseminating information. The recently published Best Practice Guide for Cleaner Production in Central and Eastern Europe was prepared by OECD on the basis of the experiences gained in working on specific environmental issues in Central and Eastern Europe. It recommends the establishment of cleaner production centres, which would have the task of promoting cleaner production, and would coordinate and run such programmes with the support of, inter alia, professional engineers' associations, technical institutes, or industry associations. 14/

22. An Asia and the Pacific expert group meeting on the transfer of environmentally sound technology among small and medium-sized enterprises and Techmart '96 was hosted by the Asian and Pacific Centre for Technology Transfer (APCTT) of the Economic and Social Commission for Asia and the Pacific (ESCAP) (New Delhi, 22-24 January 1996). It demonstrated the value of technology centres in providing an intermediary service between technology suppliers and potential buyers. APCTT has successfully served as a regional technology transfer broker to assist SMEs in the region in acquiring technology. With appropriate support, ARCT might eventually take on the role of an active technology transfer broker, performing functions similar to those of APCTT.

23. National cleaner production centres (NCPCs) have been established with the support of UNEP and the United Nations Industrial Development Organization (UNIDO) in China, the Czech Republic, India, Mexico, Slovakia, the United Republic of Tanzania and Zimbabwe. They have been designed to promote cleaner production at the national level through, for example, demonstration and training programmes, and the collection and dissemination of information relevant to cleaner production. Recently, UNEP and UNIDO embarked on an initiative that aims at establishing the regular exchange of information and increasing cooperation between NCPCs and over 35 other national and international environmental technology centres. 15/

D. Financing and partnership arrangements

24. It is generally acknowledged that, in many developing countries, the level of technological change necessary to make tangible progress in sustainable development can only be fully realized with effective financial support and partnership arrangements with donors. As stated by OECD, a special challenge is to enable developing countries to take full advantage of the various cleaner production options, ranging from relatively simple and low-cost process modification to sophisticated and more costly investments in pollution prevention technologies. Technology cooperation and capacity development are

therefore important policy tools for assisting developing countries in their efforts to manage technological change for cleaner production. 16/

25. Particular attention has been given over the last year to the problems of SMEs, because these enterprises make up the bulk of business ventures around the world and their environmental implications and resource demands are equally large. SMEs typically do not have the capital needed to invest in modern pollution control equipment or cleaner production technologies. In the market for ESTs, the private sector has often concentrated its investment efforts and expertise in funding large projects, primarily because large projects are easier to manage than investment in a large number of smaller projects. This has in turn deterred smaller entrepreneurs and projects from attempting to acquire funding from private international sources. Even though the rate of return is generally better with investments in SMEs, the procedural complications in processing such transactions and the lack of financial instruments designed for this type of transaction makes them economically less attractive to lenders.

26. In an effort to develop solutions to these problems, the Organization of American States (OAS) organized a meeting of experts on environmentally sound technologies for SMEs (Ottawa, 14-16 November 1995). The meeting was held in conjunction with an industry regional round table organized by the Canadian Office for Technology Exchange of Industry Canada. The meeting particularly stressed the importance of SMEs and micro-enterprises for alleviating poverty and promoting economic development.

27. A separate background paper on financing environmental technologies for SMEs is before the Commission. The paper summarizes the different sources of general finance available for ESTs, and emphasizes the very significant differences between medium, small and micro-businesses in their ability to gain access to finance; it covers both international and domestic sources of finance for SMEs. Internationally, the most relevant source of direct finance for SMEs is venture capital, mostly for medium-sized business. A sample of over 60 international venture capitalists were surveyed, representing the majority of the international supply of venture capital.

28. The background paper examines the role of the public sector in helping to improve access to finance for ESTs by SMEs, including both fiscal and financial measures. Fiscal measures, such as tax allowances or tax incentives for "green" investment, can be very effective at "kick-starting" a market, but they are expensive and their use needs to be carefully controlled. Improvements in the tax system to internalize environmental costs and remove subsidies are very effective in encouraging the use of ESTs, but are subject to political constraints.

29. Financial measures can be more targeted in their application, but can be expensive and bureaucratic. Grants and direct subsidies are flexible and powerful, but because of their costs should only be used to initialize markets or where other finance is unavailable. Making existing export finance programmes more applicable to the needs of ESTs is a clear way that Governments can contribute to sustainable development and support their own industries. Loan guarantees are effective at encouraging lending to SMEs and could be linked to the acquisition of ESTs. Leasing is a major source of financing for SMEs,

and potentially could be very useful in EST financing; thus, supporting the development of leasing initiatives in this area appears sensible. More complex mechanisms, such as performance contracting, are worth supporting, but their success is more problematic.

II. RECOMMENDATIONS AND PROPOSALS FOR ACTION

30. Helping small and medium-sized industries to adapt to cleaner production and environmentally sound technologies remains a major challenge, since such businesses constitute a large portion of the pollution problem in many countries and have difficulty in gaining access to needed financial resources and information. Governments of developed and developing countries and economies in transition are encouraged to develop and implement an appropriate mix of policy instruments for stimulating the adoption of cleaner production technologies and improved, more efficient systems of production that emphasize the prevention of pollution and the minimization of waste.

31. The ISO 14000 series has considerable potential to stimulate the adoption of environmental management standards and practices among a wide variety of enterprises throughout the world, on a voluntary basis. It may also serve to encourage the wider use and adoption of cleaner production processes and techniques, as well as environmentally sound technology in general. There is a need to monitor how the adoption of the ISO 14000 series of standards will affect the way that firms meet environmental goals while making their production processes more efficient, and what the impact of these standards will be on companies in terms of their use of ESTs and cleaner production methods.

32. Partnerships between the private and public sectors, including through voluntary agreements, should be encouraged as a means to agree on and achieve environmental goals and objectives, and to demonstrate the economic and environmental benefits that can accrue through the application of ESTs and cleaner production methods with a view to enhancing eco-efficiency concepts. As referred to in the recommendations adopted by the meeting mentioned in paragraph 26 above, there is a particular need to include SMEs in such partnerships. 17/

33. UNEP should be encouraged to continue its work to develop an EST information system network that will increase compatibility and cooperation among information systems and sources related to ESTs, and to report to the Commission. UNEP is invited to develop and maintain a catalogue of EST-related information systems, and to eventually make this catalogue publicly available in printed form or on diskette and/or through the Internet. A periodically updated survey of information systems could be very helpful for information users in identifying information systems and in seeking appropriate information on ESTs.

34. Governments are encouraged to carry out NTNA pilot projects in priority areas of development and/or environment. In identifying priority areas, national environmental sustainable action plans or sustainable development strategies - where these exist - should be used. Since many providers and recipients of ESTs are private enterprises, national and international public agencies should make a determined effort to establish a dialogue with business

associations in industrialized and developing countries to involve the private sector in national technology needs assessment. Through its participation, the private sector may explore investment opportunities generated through NTNA and thus enhance technology cooperation.

35. National cleaner production centres are beginning to play a major role in implementing specific functions related to cleaner production, as identified by the Commission in the work programme. Developed and developing countries and economies in transition are encouraged to establish and to make efficient use of existing cleaner production centres, with the support of international organizations, where necessary, with a view to promoting cleaner production and coordinating and running such programmes.

36. Governments of developed and developing countries and countries with economies in transition are urged to strengthen, in cooperation with regional institutions, the role of technology intermediaries and brokers as facilitators of the transfer of ESTs, in particular in support of meeting the technology needs of SMEs. In this regard, innovative partnerships among technology transfer facilitators should be promoted to increase exchange of experiences and to benefit from successful operating intermediary brokers, such as APCCT.

37. Governments of developing countries and economies in transition are encouraged to strengthen, with the assistance of donors, where necessary, EST support structures, including technical advisory or consultancy services, marketing support, legal advice, research and development and laboratory facilities and services, assistance in project formulation and negotiation, and technology sourcing and matchmaking.

38. Improved access to private capital will be a key to success in providing EST opportunities for and improving the environmental performance of SMEs. Such companies have difficulties in remaining competitive in the rapidly expanding international marketplace. Governments should apply appropriate measures that would assist SMEs in gaining access to private financial markets and would provide incentives to stimulate EST investments. Larger companies and transnational corporations could facilitate access of SMEs to financial markets by, for example, including them in production chains or other contractual arrangements.

Notes

1/ See Official Records of the Economic and Social Council, 1995, Supplement No. 12 (E/1995/32, chap. IC).

2/ See Arthur D. Little, "Sustainable industrial development: sharing responsibilities in a competitive world", paper prepared for the Dutch ministries of housing, spatial planning and the environment, and economic affairs (February 1996).

3/ See H. Laurance Fuller, "Industry oils the wheels of cooperative effort", in Environment Strategy America 1994/95 (Campden Publishing Ltd., 1994).

4/ See "1995 Report on the state of the environment in Asia and the Pacific", Asia-Pacific Environment Newsletter, Special Issue (November 1995).

5/ "Promoting cleaner production in developing countries: the role of development cooperation", OECD document (Paris, 1995).

6/ See "Hungary: towards strategic planning for sustainable development", national information provided to the Commission at its fourth session by the Hungarian Commission for Sustainable Development.

7/ See "Progress towards sustainability", report prepared by the European Community.

8/ See national report of the Netherlands, submitted to the Commission at its fourth session.

9/ See report of the Expert Meeting on Information Systems on ESTs, Paris, 9-11 October 1995.

10/ ICPIC@UNEP.FR.

11/ See "Industry and environment", in 1995 UNEP Activity Report (Paris, forthcoming publication).

12/ See report of the International Expert Meeting on the Assessment of Technological Needs for Sustainability, Scheveningen, the Netherlands, 5-7 February 1996.

13/ See report of the African Regional Workshop on Technology Needs Assessment in Support of the Transfer of ESTs and International Technology Cooperation, Dakar, 17-19 January 1996.

14/ See OECD, Best Practice Guide for Cleaner Production Programmes in Central and Eastern Europe (Paris, 1995).

15/ See "Experiences in EST transfer and cooperation", keynote presentation by John H. Skinner at the African Regional Workshop on Technology Needs Assessment ...

16/ See "Technology cooperation and capacity development: future work", report of the Development Assistance Committee Working Party on Development Assistance and Environment of OECD on its thirteenth meeting, Paris, 24 and 25 October 1995.

17/ "Recommendations made to the Organization of American States by the Meeting of Experts in the Area of ESTs for SMEs" (Ottawa, Canada, 14-16 November 1995).